



X-RAY ASTRONOMY 2019

Current Challenges and New Frontiers in the Next Decade

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Spin-Reversals in the X-ray Binary Pulsar OAO 1657-415

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OAO 1657-415 is an X-ray binary pulsar that exhibited a long-term spin-up trend with short-term torque reversals in the past. In this work we present over 10 years of data from Fermi/GBM and Swift/BAT to study the long-term spin behavior and the torque-flux relation of this source, using current accretion torque models. The frequency history shows that the source is no longer on a spin-up trend but has settled in an equilibrium spin period of about 27 mHz with short-term spin-reversals. The analysis of the torque-flux relation shows a correlation when the source is spinning up, indicating that matter is likely accreted from a stable accretion disk. The observations during the spin-down of the pulsar could be explained by accretion from a retrograde disk or a sub-Keplerian behavior of the disk. The accretion process in this regime, however, remains elusive. A domain where the torque is close to zero has also been observed with a highly scattered flux, which could be explained by direct accretion from the stellar wind of the companion.

Topic

Compact and diffuse sources in galaxies and in the Galactic Center

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